

Flight, September 11th, 1909.

# Flight

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PROPOSED AVIATION WEEK AT BLACKPOOL FROM OCTOBER 18th TO 23rd.—General view of the sea front, Blackpool, as seen from the Eiffel Tower, and the Marine Drive as enclosed for the great Motor Race Meeting which was promoted by the Corporation some years ago. A prize of £500 has been offered for the first aviator who, during the week, flies over the Blackpool Eiffel Tower.

## IN THE DAWN OF KNOWLEDGE.

ON more than one occasion it has been pointed out in *FLIGHT* that it is part of the inevitable process of developing the movement of aerial navigation that there will be a toll of human life, especially since we have entered the region of practical achievement. Similarly, too, we have remarked upon the astoundingly small list of casualties that has so far accompanied what might naturally be deemed at first a most hazardous undertaking. The progressive stages of ballooning were achieved by the process of trial and error, and have been marked by a series of accidents extending over many years which are nevertheless not numerous in comparison with the extraordinary nature of the achievement. If one takes all the balloon voyages that have been made and works out the average of accidents, it will be found that the sport is no more risky than is steeplechasing, which is an ancient pastime that cannot be regarded as progressive, whereas ballooning has been brought to its present stage of safety from considerably risky beginnings.

The sister line of development in regard to aerial locomotion by means of the heavier-than-air machine had to be evolved through gliders, firstly to discover the rudiments of how to ride the wind, and, secondly, because no suitable engine was in existence, inasmuch as the petrol motor that has made flying practicable is a machine that, in point of years, is about contemporary with man-carrying gliders. In the days when the stationary gas-engine was being evolved, one of the Spencers was already making experiments with gliders in this country. When we come to the light internal-combustion motor, using petrol-gas, which was the logical development of the stationary coal-gas engine, we find that it began to be practically useful about a dozen or fourteen years ago, what time Lilienthal in Germany was doing extraordinary things with man-carrying gliders. And the mention of the work of one of those brothers reminds us that he had to give his life for the great cause, even as Percy Pilcher did in England. Needless to say, those lives were not given uselessly, for the knowledge embodied in the machines was the root matter on which Chanute and Langley were able to develop their experiments in America. From their work, in turn, came the progress made by the Wrights, and so back to Europe. Their early glidings were the basis of many experiments made by MM. Ernest Archdeacon, Voisin Brothers, and Esnault-Pelterie, among others. Thus we can trace the logical development of the flying machine of to-day, and can prove that the relatively few lives that have been given have not been sacrificed in vain.

What may be called the preliminary work and proving of the practicability of flight concluded with the power-driven and, at the time, quite unheeded aerial experiments of the Wrights about 1905. The phase that has followed since those days is, as it were, the second stage of development. It is a stage in connection with which it would have been quite reasonable to expect a very heavy toll of life. Yet we find that to this day, from the stage of the Wrights' first achievement, two lives only have been lost, that of Lieutenant Selfridge, and that of young Lefebvre. The fact is little short of marvellous, for if we take the most ordinary developments, such as that of the railway, for example, the fatal accidents in the pioneer days of that movement were very numerous indeed. But none can gainsay that, from the point of view of the advancement of civilisation and humanity, the price that

was paid for the evolution of the railway was dear. When a man tries to ride the wind he enters an element that is not only unknown; it is invisible. On the land a hill or a corner can be seen. On the sea the waves are visible. But in the air the myriad quicker and relatively more powerful currents and gusts are each viewless. Indeed, the problem is quite the most difficult to which man has yet turned his ingenuity. Nor can aught be more amazing than the degree of success that has attended his efforts.

Deeply as we regret the fatal accident to Mons. E Lefebvre during the past week, it yet calls to mind, as we have already stated, how mercifully small in relation to the progress made in flight has been the toll of human life. The new accomplishment is one that we might quite reasonably expect to be the most risky conceivable. In the beginning one might expect that there would be accidents at almost every other essay, so that to gain the knowledge of to-day there might have been 200 lives lost with power-driven aeroplanes in place of two. Even in the early days of cycling there was no lack of fatal accidents. Again, in reviewing the history of bicycling, we can say that lives have not been lost fruitlessly, for millions in the world to-day find cycling a cheap, a healthful, and a mighty convenient means of locomotion, and the toll in relation to the total number of users of machines is again infinitesimal. Doubtless we shall have to witness many long years of flight before we can look back and view it in like perspective. But we are confident that our successors in those days will be able to tell the same story in regard to aerial locomotion that we can relate concerning the railway, the cycle, and kindred developments. In these initial stages of a mighty development there must necessarily be certain features on our machines that are wrong, apart altogether from the inexperience of the most experienced of the pilots. Nothing but experience can show which feature or manœuvre is risky, and which is reliable. The toll is inevitable, but fortunately it bids fair to being astoundingly small; and, even though to-day we are still engaged in experimental work, happily it is in the second stage.

This particular case of Lefebvre serves incidentally also as a reminder of the coming into being of a new profession, that of the aeroplane tuner-up whose duty it is to take a machine before he knows for certain whether it is right or wrong in every detail and to fly with it. Lefebvre was undoubtedly the very man for the work—of good physique, superb nerve, with plenty of daring and excellent mechanical ability. He taught himself how to fly in place of being taught, and, despite the relative brevity of his experience, he showed that he could fly in a manner surpassing that of the Wright pupils who had had the best part of nine months' training.

His brilliant evolutions in the air at Rheims will be fresh in the memory, as will be the fact that he was fined by the organisers for doing rather over-daring things. Indeed, as a man he was of a daring type. But we want such for the particular class of initial work that he took in hand. We deplore his loss, but we admire the man. And the consolation of those who mourn him must be that his life was given in a grand cause. Others, and yet others, will continue to carry on and to perfect the pioneer work which he was fortunate in devoting his young and useful life to forwarding.

# THE FLYING RACES AT RHEIMS.

BEING A GOSSIP ABOUT AN HISTORICAL MEETING THAT MARKS AN EPOCH IN THE DEVELOPMENT OF AERIAL LOCOMOTION.

By H. Massac Buist.

(Concluded from page 541.)

It was delightful to see the different methods of tuning up, quite one of the most ingenious being that used by the Bleriot machines, that were tied to a stake, and the tractive effort taken by an hydraulic measurer, so that before starting out on a flight it could be ascertained exactly whether or not the machine and propeller were acting with absolute efficiency.

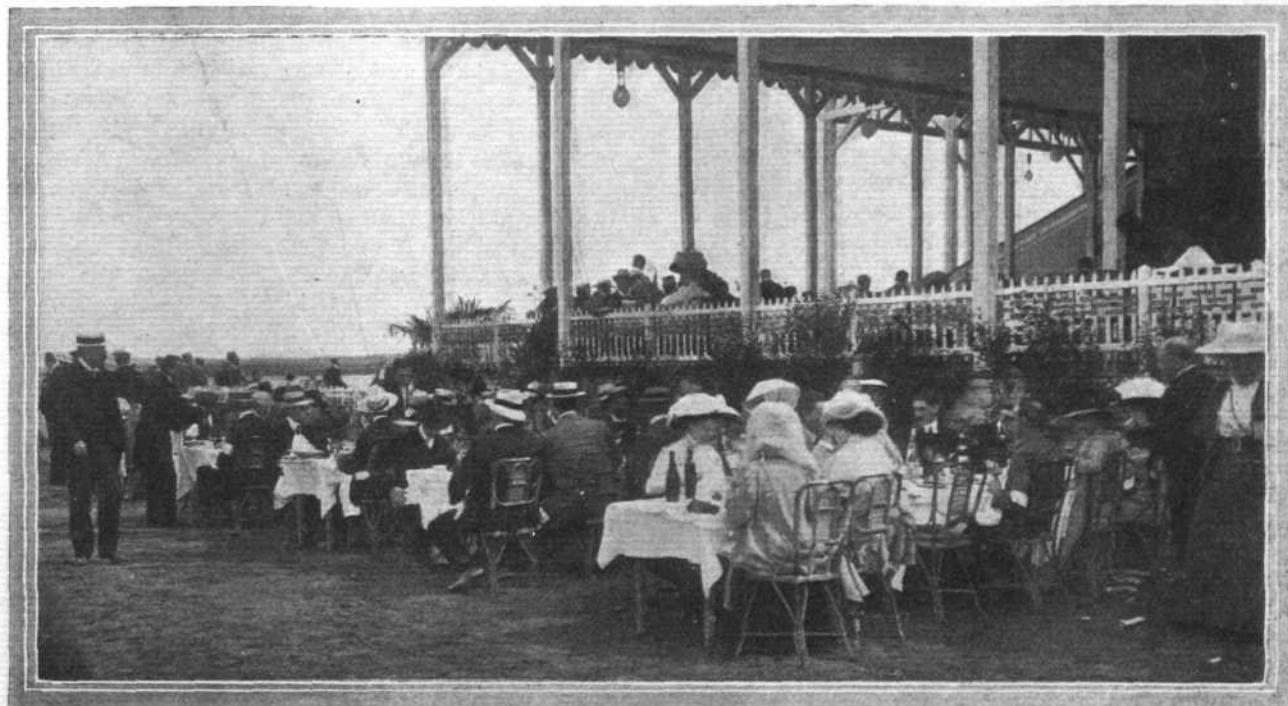
At present there is no set rule for your conduct in starting to aeroplane. Your bulky machine may be taken to a suitable spot by a bevy of willing helpers, including your mechanics, the picture putting one in mind of a lot of ants leading a fly—excuse the pun. Or, the aeroplane may be taken across the ground by a patient farm horse that has long since learnt not to be alarmed by any sudden starting up of an unsilenced engine, while in yet other cases motor cars were used to tow the planes, even as horses came to rescue cars in the beginning of the older movement. There is also the Wright system, which is a laborious one, of placing the machine on two one-wheeled trestles and marching out to the starting rail with it, in which connection it is to be had in mind that, though they used the rail, the starting weight was rarely employed in the case of the Wright machines. The usual Voisin, Bleriot and Farman method, was to get to the starting place under their own power.

In regard to launching into flight, some of the machines appeared to be very sensitive, such as the Antoinette, and some of the Voisins, which were usually put head to wind, if there was any, whereas the Farman, the Bleriot, and the Curtiss aeroplanes seemed relatively indifferent, because in any case very little wind was blowing. Nevertheless, the variety of the requirements of the machines, accounted for in no mean measure by the differing experiences and aptitudes of their pilots, provided a very interesting spectacle on the taking-off ground, where one

would see such persons as Rougier spending the best part of an afternoon in the effort to get going. He was rarely without company. You would see the machines of large spread scurrying and scudding about the ground in all directions, presenting somewhat the appearance of a lot of gigantic fowls fluttering about a vast farmyard.

It needs a deal of practice for the eye to tell exactly when a machine leaves the ground, for it must not be imagined that they leap into the air. Sometimes they go up for a few yards, then come to earth again, and do not lift until they have gone two or three hundred yards further. Plainly, it does not pay to give up just because you do not get off the ground permanently after the first launching. Some proceed half way down the course before they quit the earth. The quickest machine of all to launch in flight was the Curtiss biplane, which was absolutely amazing. Sometimes it would be in mid-air in less than fifty yards going. As a rule the flyers are held back when the engines are started. They are let go after the screw is turning at its proper speed, in which connection one witnessed the same spectacle that was seen again and again at Pau in February. That is to say, people would stand in line with the turn of the screws, so that if a blade broke they were in imminent peril of being killed. Seemingly there were no regulations to prevent their doing this, though I think there ought to be.

I do not propose to describe the competitions, for the detailed results of each have been set forth in another form on other pages of FLIGHT. From the point of view of recounting the story of a race, in the case of aeroplanes, at present it is impossible to do so, because the various competitors did not start at the same time. The competitions therefore resolved themselves merely into flights against the clock. Hence, from the spectacular point of view, the interest was in the manner of the flight.



How the French visitors lunched in front of the Grand Stand.

Whether the performance had bettered that of another competitor in the same event did not appear until the times were announced twenty minutes afterwards.

The Bleriot, the Wright, and—with the exception of Paulhan's—the Voisin machines flew the lowest, while the medium height flyers were the Farman and the Curtiss biplanes, and the normal high flying machines were the Antoinette monoplanes, that usually took a comparatively long time to get launched in flight. One result of these characteristics was that we saw aeroplanes not only outgoing one another when flying side by side on a level, but speeding one over the top of another. In one thrilling moment—a "minute inoubliable," as the French say—after rounding a corner tower, three machines appeared in tier fashion. Of course we have had to wait for the Rheims meeting to behold those spectacles, and to learn that such things could happen. It does not matter to the "top dog," but the "under dog" certainly "feels the draught" of another aeroplane overhead. Henri Farman says that when he was making his record flight of  $112\frac{1}{2}$  miles, when machines were flying above him, he felt very distinct tendencies to drive him earthwards.

In regard to tactics, it is plain that these will play a very important part in the future of flying machine races. For example, the quadrangular course was marked out by four wooden towers, each of which had to be passed by competitors on their left. Now in going for a speed trial you do not want to travel an extra yard by taking a corner wide. At the same time you dare not run the risk of disqualification by going the wrong side of the tower. Gentle and negligible as one would have deemed the breezes to be at Bétheny, nevertheless there were several occasions when one would see an aeroplane approaching a corner tower. When within two hundred yards of it, it would seem to be lifted slightly by an invisible hand, and cast sideways out of its course. In other words, it had been caught in a slight side gust, the motion being so fluent that the flyer appeared to be borne on springs. Such occurrences caused the competitors to tack with the utmost promptitude of which they were individually capable. Then they passed the post well before they attempted to turn. In any case, the practice of practically all except the Wright machines—that appeared relatively unaffected by side gusts, but which, in the hands of their pilots, with the possible exception of Lefebvre, described very undulating flight paths at Bétheny—came very wide up to the corner, then turned as quickly as they could. With most, turning seemed to involve a certain loss of speed. Consequently, those pilots concerned each approached the turn at what was for him a relatively high altitude. Having executed the manœuvre, he would dive down to his normal height so as to pick up speed in the descent.

The control of the various machines differed extraordinarily. That of the Antoinette, that possessed a remarkable degree of fore-and-aft stability, is certainly planned on a very seamanlike system, for each part of the mechanism has a definite movement only, so that, when having to act on a sudden, there is no likelihood of the pilot making a muddle of things, as is so easily possible with the Bleriot, the Farman, or the Wright, on each of which machines one hand can execute a more or less universal-lever movement, so that, when confronted with a crisis, it is the easiest thing in the world to thrust out the hand to the wrong point of the compass, as it were. Even the fore-and-aft thrust of the steering pillar to control the elevating planes of a Voisin biplane calls

for very nice handling if you are not to make your machine stand on its head. Once launched in flight, the Antoinette needs less skill on the part of the pilot than any other machine. And the firm has a very good demonstrator in Hubert Latham. That is to say, you shall find him coming along the straight in front of the grand stand, and letting go his wheels while he lifts his cap well above his head, and replaces it more comfortably; or he will steer by resting his elbow on one of the wheels and placing his chin on his hand as though he were musing verses in mid-air. On one occasion, when he was overhauling Delagrange on a little Bleriot monoplane below him, he let go both side wheels, and, placing a hand on either side of his air-boat, raised himself so that he was able to lean over and look down on his aerial rival immediately beneath him. A little after that, too, he caused the onlookers to draw breath because he made the machine dart down as though it were going to pitch to earth head foremost, but when within about 20 feet of the ground without effort he brought it horizontal again. These are what the Americans style "stunts." Yet I do not think that in the case of the particular machine in question in calm weather they are in the nature of foolhardiness, for the Antoinette monoplane has a deal of automatic stability. But I do not imagine any of the other machines represented can approach it in that respect, though the Farman and the Voisin are better than most. The next easiest machine to control appeared to be the Curtiss biplane, which was quite extraordinarily speedy and on which the pilot takes up a position that gives him an obviously comfortable command of the machine. He really looks as though he had control of it, whereas on the Farman and Bleriot aeroplanes the intense attention that is necessary on the part of the pilot is very apparent indeed. The honest, stolid Voisins, however, provide a fairly normal and comfortable position for the pilot.

There are wide differences, too, between one aeroplane and another in point of landing. The Farman seemed to come to earth most perfectly and with least shock, for none was softer even when he had two passengers aboard; whereas the Antoinette certainly seemed to have need of all its elaborately ingenious arrangements for absorbing shock when alighting. It comes clumsily to earth. One got a very good notion as to how substantially these seemingly flimsy machines are built when such a man as Rougier alighted. A quintette of mechanicians leapt at different parts of the biplane like so many cats, thrust out their feet before them, and so skidded until they had brought the flyer to a stand.

And the exigencies of space dictate that I should put a period to this gossip, too.



#### M.P.'s and Aviation.

AMONG those who were very greatly impressed by all that they saw at Rheims was Sir Henry Norman, and he has since succeeded in getting many other Members of the House of Commons to share his convictions with regard to the future of flying. At the last meeting of the Committee, Sir Henry Norman proposed no less than nine of his colleagues at St. Stephen's for election as members of the Aero Club. These new Parliamentary members are Sir John A. Dewar, Bart., M.P., the Hon. Ivor Guest, M.P., Sir William H. Holland, Bart., M.P., Sir Francis Layland-Barratt, Bart., M.P., Messrs. T. H. D. Berridge, M.P., W. Burdett-Coutts, M.P., W. H. Lever, M.P., Alfred Mond, M.P., Col. J. E. B. Seely, D.S.O., M.P.

## TERMS IN FLIGHT.

SOME little time ago we published a glossary of terms in flight, which was illustrated by small sketches showing the parts of the machine in detail. It has since seemed to us, however, that it would be useful to our readers to supplement that glossary with another set of illustrations, which appear on the accompanying page, showing the terms in relationship to a complete machine.

For this purpose we have drawn out an imaginary design (page 554) which represents no actual machine in particular, although it includes the characteristic features of the more important flyers, and on that sketch we have placed the names of the various parts as they are described in the articles we have published and are continuing to publish, relating to the leading flyers of the day.

Starting with the main deck, the first essential is to specify the transverse and longitudinal dimensions. For the first the term "span" is in common use, and suggests itself from the beginning, but for the fore and aft dimension there has been lacking a concise term, and for this we have introduced the word "chord" as a suitable term which combines with the desired brevity an equally important accuracy of definition. The decks of all modern flyers are cambered, and it is in reality the chord between the leading and trailing edges which is measured when giving the fore and aft dimension. The "camber" itself is the term applying to the maximum versine of the arc subtended by the chord, and its position is commonly well in front of the semi-chord; decks being no longer cambered in the form of an arc of a circle. The tangent to the leading edge of the deck makes with the chord the "angle of entry," while the tangent to the trailing edge of the deck similarly makes with the chord the "angle of incidence" and defines the "attitude" of the plane, while the numerical value given by the ratio of the span to the chord similarly defines its "aspect." When this ratio is greater than unity, the planes are in "broadside" aspect, when less in unity they proceed "end on." Other but less convenient terms have been suggested by Lanchester, who uses "pterygoid" to imply broadside aspect and "apteroid" for edge-on aspect. In modern machines the broadside aspect is invariably adopted, and the aspect ratio is in the order of 5.

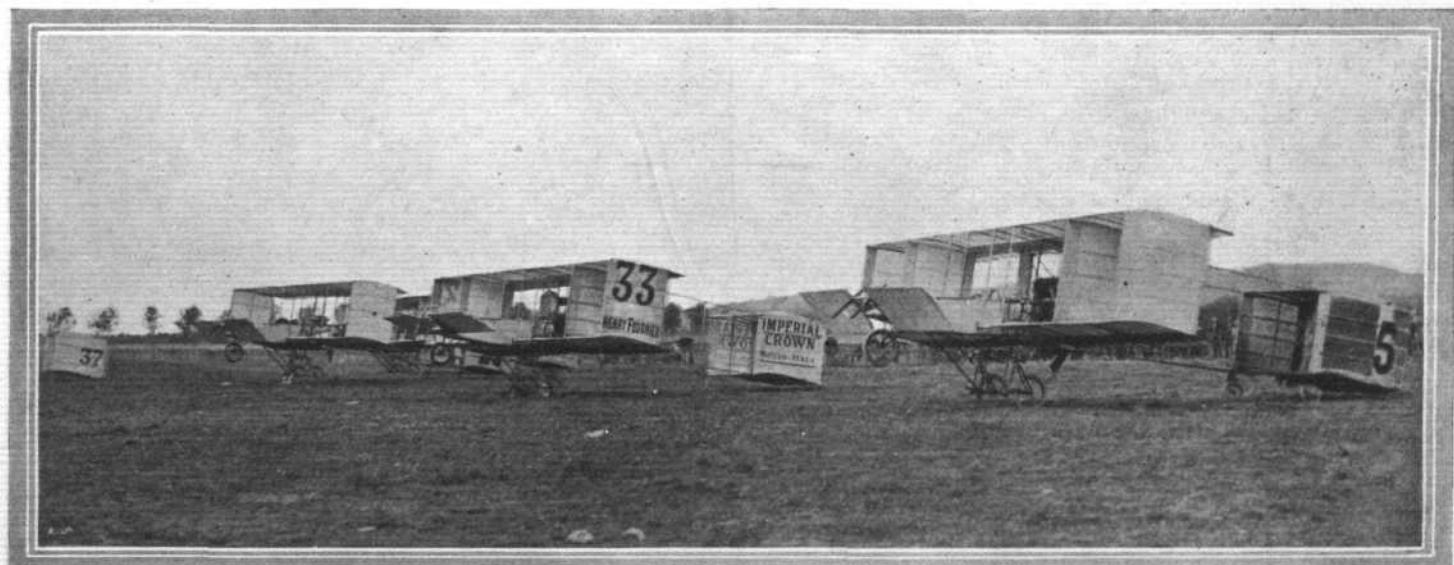
When the flyer is not a monoplane, the decks are removed from one another by a "gap," which is commonly equal in dimension to the chord. The decks are separated by "struts" fastened to the main transverse "spars," and the joint which secures these members may be either flexible or rigid, according to the underlying principle which governs the construction of the machine. Very often, although it is not an invariable practice, vertical "curtains" are stretched between the decks near the extremities. In the Voisin biplane there are four such curtains arranged so as to give a box-like construction to the extremities of the main decks.

The decks themselves are either single or "double surfaced," according as they have one or two layers of fabric. When single surfaced it is common practice to so arrange the fabric as to enclose the main transverse spars in "pockets" in order that sharp angles may be avoided. Single-surfaced decks also commonly afford a "flexible trailing edge," inasmuch as the fore and aft ribs, which invariably project beyond the rear transverse spar, are usually much thinner and more flexible than those used in double-surfaced decks. The rib for a double-surfaced deck is more elaborate in construction, and is itself stiffened with "webs." It encircles the main spars, and thus when covered with fabric affords a perfectly smooth contour above and beneath.

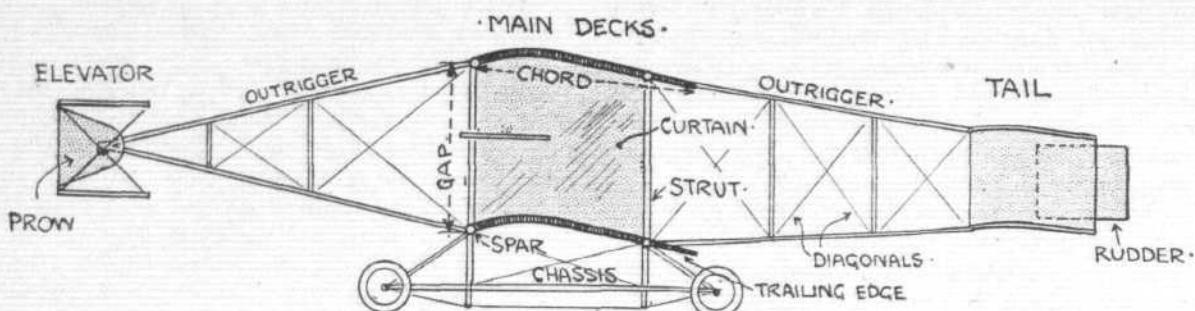
In addition to the main decks, there are a certain number of supplementary surfaces, among which are commonly included a tail, rudder, elevator, prow, and balancing planes. The side curtains already mentioned also belong to the supplementary surfaces.

The "elevator" and the "tail" are carried on "outrigger" formed by a light lattice girder framework braced by struts and "diagonal" wire "ties."

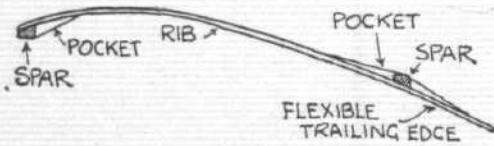
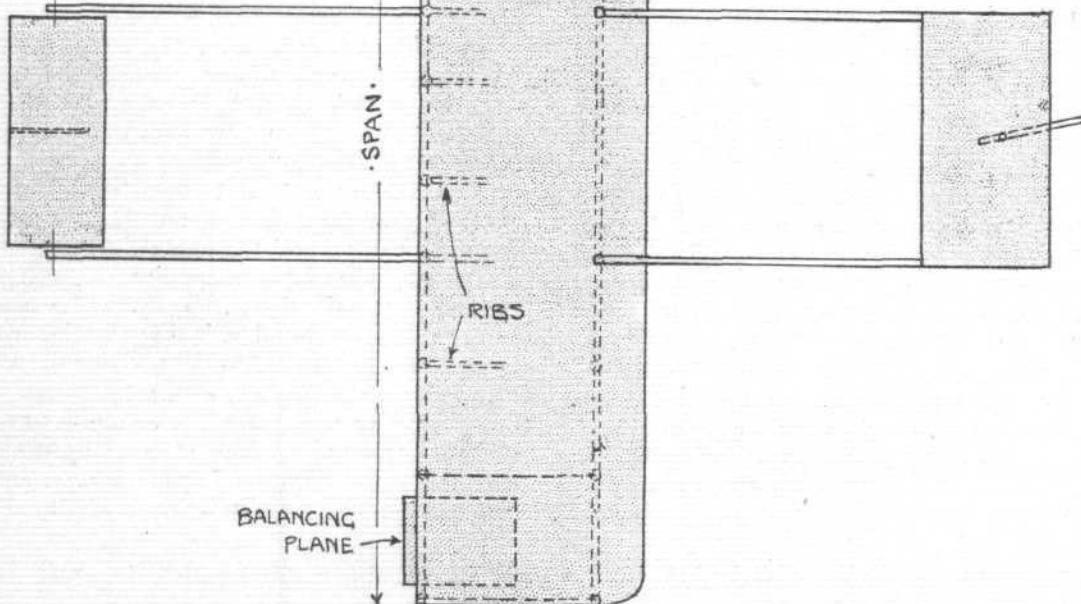
The tail consists essentially of a horizontal plane behind the main decks, but it may be elaborated into a biplane, and also fitted with side curtains as on the Voisin flyer. On the second Wright glider there were a couple of fixed vertical planes which took the form of a tail, but at the present time it is common to regard a tail as essentially including one or more horizontal supporting surfaces. The "rudder," which is used for steering, is of course commonly behind the machine, although it may



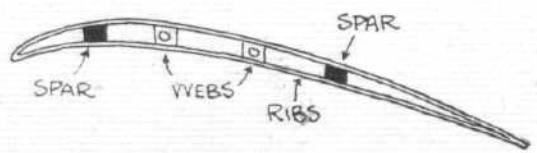
VOISIN AIRCRAFT AT RHEIMS READY FOR THE STARTER.—The machines are:—No. 5. Jean Gobron biplane (Gobron motor); No. 33. Henry Fournier's machine (Itala motor); No. 27. M. E. Buna-Varilla's machine (E.N.V. motor); and the tail seen on the left is M. Sanchez Bensa's Voisin (Antoinette motor).



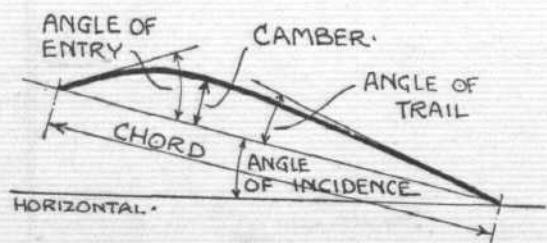
$$\text{ASPECT RATIO} = \frac{\text{SPAN}}{\text{CHORD}}$$



• SINGLE SURFACED DECK •



.. DOUBLE SURFACED DECK ..



TERMS IN FLIGHT.—For the guidance and information of our readers.

be in front in duplicate. The elevator on a biplane is placed in front, but on a monoplane the tail may be made to serve the purpose of an elevator. The elevator itself consists essentially of a pivoted horizontal plane or planes arranged under the pilot's control. Somewhere in front of the machine there is commonly to be found fixed a vertical plane which serves as a "prow" to give the machine sensitiveness to the rudder.

For the purpose of maintaining lateral stability various devices are used, ranging from the "warping" of the main planes themselves, as performed by the Wrights, to the use of entirely independent "balancing planes," as illustrated in the accompanying sketch. These planes have been shown for convenience as situated in the gap, but sometimes they form extensions to the main tips of the decks, and sometimes they are arranged like lips behind the trailing edge. In any case the term

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## PROPELLER MATHEMATICS FOR NOVICES.\*

By JOHN SQUIRES, M.E., Chief of Physical Laboratory, E. R. Thomas Motor Co.

(Continued from page 395.)

In dealing with the proposition that the fact of one propeller (or machine to which the propeller is attached) having a higher thrust per h.p. against a fixed point than another does not signify that the first propeller (or machine) will travel faster through the air than the one with the lower thrust per h.p., it will probably be easier to follow the demonstration if concrete values are assigned to the several variants to give them quantitative individuality, especially when considering the effect produced by changing the value of the variants.

It is of course remembered that the air-moving type of propeller is being considered, and before taking up the proposition of propellers in flight, it is advisable to analyse the function of each variant in utilising the power put into a stationary propeller.

Let it be considered that all the power input is used in producing work, as to consider less than perfect efficiency would complicate the demonstration too greatly for the present purpose.

Accordingly, resuming consideration of propellers thrusting against a fixed point, and supposing that we have a theoretically correctly designed propeller that we can adopt as a standard for analytical purposes and a base from which to consider variations, and in the abstract this is simply a machine doing useful work in moving a certain weight (in this case the weight of the air moved) a certain distance (equal to the pitch multiplied by the speed of revolution) in a certain length of time, and, therefore, it is possible to take the algebraic expression for work and factor it to include the functions of all the variants (or elements) involved in producing this work.

The formula "reductum" for work being  $\frac{1}{2}mv^2 = W$  (in which  $W$  represents foot-pounds) or a better expression for the present purpose,  $\frac{mv^3}{2} = W$ . This can be functioned for the element of weight by converting the mass into its factors, and then becomes  $\frac{wv^3}{2} = W$ , or in

its usual form  $\frac{wv^2}{2g} = W$ . As  $w$  represents the total weight involved, this must necessarily be composed physically of a number of units; so let a cubic foot of

"balancing planes" is adequate to describe the purpose of such devices for the present, although it may be found necessary to use special terms in the future.

The machine as a whole is either mounted upon a wheeled "chassis" or upon runners, the former being illustrated in the accompanying sketch. The term chassis is employed to denote the whole of that part of the construction which relates to the supporting of the machine upon the ground.

With these terms we have endeavoured to cover the more important parts of a flyer as it is known at the present time, and having adopted the simplest words available for the purpose, we have aimed thereby at assisting readers to understand with a minimum of trouble the description of machines which we give from time to time in these columns.

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## PROPELLER MATHEMATICS FOR NOVICES.\*

By JOHN SQUIRES, M.E., Chief of Physical Laboratory, E. R. Thomas Motor Co.

(Continued from page 395.)

air be considered as a single unit called  $w$ , and  $w$  then consists of  $w_1$  multiplied by the total number of cubic feet of air moved in a certain unit of time. Let this total number of cubic feet be called  $C$ , and by substitution the formula becomes  $\frac{Cw_1v^3}{2g} = W$ .

Before the formula can be factored further to functionate the effect of the four variants, it is necessary that each of them be represented by a symbol.

The power involved (or its equivalent expression, work) is already represented by  $W$ . Let the speed of revolution per second be represented by  $R$ , the area throughout which the propulsive effect is exerted by  $A$  and the pitch in feet by  $P$ , and we can proceed to factor for the functionate value of each of these in the formula.

Looking for an opportunity to factor further, it is seen that the individual symbols  $C$  and  $v$  in the formula are the results of combinations of sub-values. Factoring  $C$  for its components, it is found that the total quantity of air moved in a unit of time is dependent on the pitch, the area and the number of revolutions in that unit of time, and making the indicated substitution, the formula reads  $\frac{(APR)wv^2}{2g} = W$ .

As  $v$  equals the velocity at which the mass travels, and is the product of the pitch multiplied by the speed of revolution, another substitution can be made, and the formula completely factored out becomes  $\frac{(APR)w_1(PR)^2}{2g} = W$ , which simplified is  $\frac{AP^3R^3w_1}{2g} = W$ ,

or expressed as an equation  $\frac{AP^3R^3w_1}{2gW} = 1$ , and we now have an equation which explains the function of each of the variants in converting the power input into work output, and permits the intelligent determination of the correct relative values of these variants toward each other in actual practice.

It is now possible to create an actual standard properly functioned propeller for the purposes of comparison, and such values as are apt to occur in actual practice may be assigned to as many of the variants as possible. So, taking, say, 20 h.p. at 20 r.p.s. (1,200 r.p.m.) and an area of 50 sq. ft. (equal to about 8 ft. diameter), all of which are within present practical limits, and it is possible to

\* From American Aeronautics.

determine the correct value for the pitch, by substituting the numerical values for the corresponding symbols in the equation.

No value has yet been assigned to the symbol  $w_1$  in the equation, but as we are dealing with air in units of cubic feet, the value of  $w_1$  is therefore, the weight of one cubic foot of air, which can be taken approximately as .073 pound, although in practice this may vary considerably, depending on barometric and thermometric differences, and the velocity with which the air is being handled. The numerical value of  $g$  is, as usual, 32.16.

Now having numerical values for all of the variants involved except the pitch, the equation can be stated arithmetically thus:  $\frac{50 \times P^3 \times 8000 \times .073}{64.32 \times 11000}$ , which solved for  $P^3 = 24.2$ , makes  $P = 2.893$  and completes the full set of correct proportional values for the elements of the standard propellers thus: H.P. = 20, R.P.S. = 20,  $P = 2.893$ ,  $A = 50$ .

To get complete data for comparison, let the thrust be calculated in actual quantity also, and, remembering that the propeller can be designed to give the effect of air blowing against a normal disc, the formula  $P = SV^2 \cdot 003$  can be used by altering the co-efficient to correspond with  $V$  in feet per second, and substituting the symbols we are using here for the sake of uniformity, and using  $T$  as the symbol for thrust, it becomes  $T = Av^2 \cdot 00139$ .

Applying this formula to the standard propeller gives  $50 \times (2.893 \times 20)^2 \times .00139 = 232.67$  lbs., or 11.6 lbs. per h.p. As the proposition under consideration requires two propellers of varying thrusts per h.p., another propeller having a decreased thrust per h.p. can now be prepared for comparison.

Noting from the table (Variation 7 in our issue of July 3rd) that an increase of pitch reduces the thrust per unit of power, let the same h.p. and speed of revolution be maintained and it is evident that the area will have to be reduced.

As doubling the pitch without altering the power or speed of revolution would reduce the area to one-eighth of its previous size (this effect is not stated in just this way in the table, but can be deduced from Variation 7), it will do as well to increase the pitch any amount that will not vary the working conditions too greatly, and accordingly let the pitch be made 3 ft. and solve the

equation for  $A$ , thus  $\frac{A \times 27 \times 8000 \times .073}{11000 \times 64.32}$  and  $A$  is found to be 44.87 sq. ft., or a diameter of approximately  $7\frac{1}{2}$  ft.; and calculating for thrust  $44.87 \times (3 \times 20)^2 \times .00139 = 224.18$ , or 11.2 lbs. per h.p.

With theoretically perfect efficiency, we now have the equivalent of two normal surfaces, one having an area of 50 sq. ft. and being moved at a velocity of 57.86 ft. per second with an expenditure of 20 h.p., and one having an area of 44.87 sq. ft. and being moved at a velocity of 60 ft. per second utilizing the same h.p.

Now, presuming that the total head resistance of the machine (whether composed of area and drift in a dynamically sustained machine or area alone in a buoyancy-sustained machine) to which the propeller is attached, is equal to the resistance caused by a surface of 20 sq. ft. area, normally presented, this resistance is proportional to the square of the velocity of flight  $v^2$  and produces slip in the propeller.

Representing the factors of the initial propulsive force in the propeller by the symbols  $A$  for the area against which the force is exerted, and  $v$  for the velocity at

which  $A$  is being moved, it is apparent that this velocity will be decreased by any additional area moved in proportion to the added resistance, which, as we know, varies with  $v^2$ , consequently symbolising the added area by  $a$ , the resultant velocity of the combined resistance is expressed by the formula :

$$\sqrt{\frac{Av^2}{A+a}} = v$$

in which  $A$  represents the surface against which the propulsive force is exerted, and  $A+a$  the surfaces presenting resistance to propulsion.

Stating arithmetically the resultant velocity of the machine with the standard propeller attached, thus :

$$\sqrt{\frac{50 \times (2.893 \times 20)^2}{50 \times 20}} = v$$

we find it to be approximately 49 ft. per second, and for the same machine with the second propeller

$$\sqrt{\frac{44.87 \times (3 \times 20)^2}{44.87 + 20}} = v$$

a velocity of approximately 50 ft per second, thus showing that it is possible for a propeller having a lower thrust per h.p. than another when the machine to which it is attached is held stationary, to drive the machine faster through the air in flight, than the propeller having the higher thrust per h.p.

I wish to specially comment on the common error of using the wind pressure co-efficient in propeller thrust calculations. I have only used it so far for the sake of simplicity in laying down comparative effects. Before closing this series of lessons I will give it differentiating values under varying conditions. As noted above, its value not only changes materially with barometric and thermometric differences and the velocity with which the air is being handled by the propeller, but also with the speed of the machine, to which the propeller is attached, through the air, its greatest variation being most noticeable in propellers designed for sustentation only, due to the increase in its value caused by the inertia of the air on the intake side of the propeller, and again in the opposite condition, of full flight, decreasing its value. This is true only of propellers revolving at constant speed, different values obtaining again when propeller and motor are so designed as to permit of the rotating speed increasing as the machine containing them acquires velocity up to the full flight maximum.



## THE "DAILY MAIL" AIRSHIP GARAGE.

The last day of August saw the garage which has been built at Wormwood Scrubbs to house the Clement-Bayard airship, when it flies from Paris to London, completed. Building operations commenced on July 15th, and although the weather has considerably interfered with the work, every available moment has been taken advantage of. On an average 150 men have been kept at work and the wages bill amounted to £2,000. The building is 365 ft. long—more than half as long again as the nave of St. Paul's Cathedral—65 ft. broad, and 98 ft. high, while the wind-resisting capacity of the structure is 40 lbs. per sq. ft. According to the *Daily Mail*, the following materials were used in its construction :—

17,000 pieces of iron sheeting, 6 ft. or 10 ft. by 2 ft.; total weight, 85 tons.

500 tons of steel girders.

Thirty-eight windows, 13 ft. by 7 ft., containing 266 sheets of frosted glass, 7 ft. by 2 ft.; total weight, 30 tons.

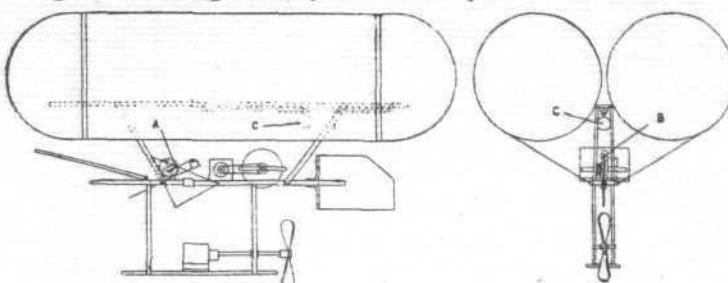
Sailcloth curtain at entrance, 100 ft. by 75 ft.; weight, 2 tons.

Asbes to the depth of 6 ins. are laid on the 23,725 sq. ft. of floor.

## INVENTORS' IDEAS.

## DIRIGIBLE WITH GYROSCOPES.

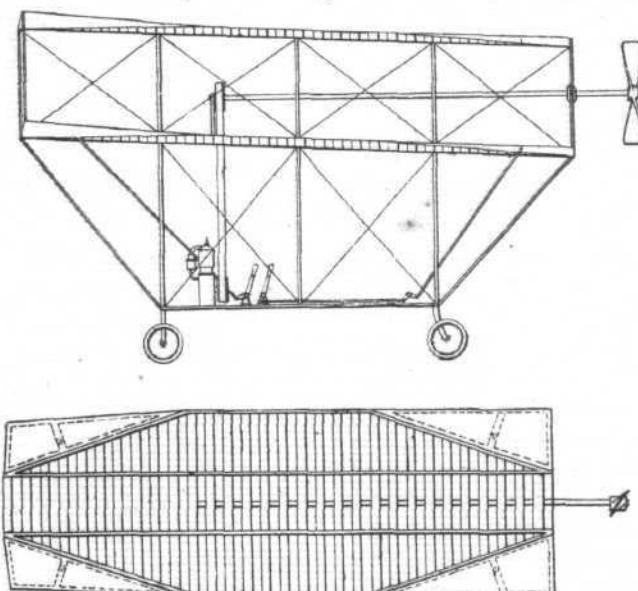
This patent describes the fitting of vertical and horizontal gyroscopes (A, B) for steadying a dirigible constructed with two gas-bags, either arranged side by side or on top of one another. The



claims also cover the use of a sliding weight (C) for balancing such an airship. Patent No. 16,606 of 1908. W. Friese Greene and Friese Greene Patents.

## A "NARROW" BIPLANE.

A biplane is described so arranged as to travel in the direction of



its larger axis. The planes consist of slats with a space equal to the width of a slat between each. Steering and controlling is effected by the hinged corner tips, which may be operated simultaneously or



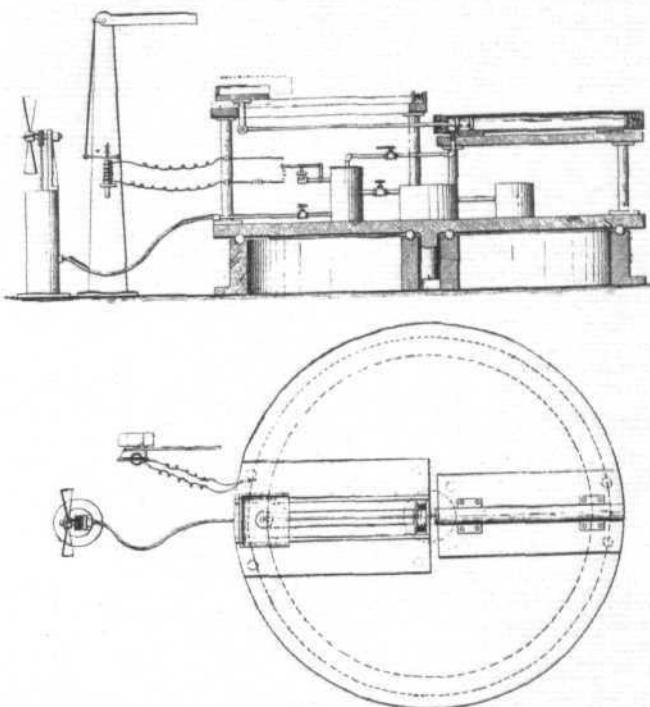
## TESTS OF MODEL PROPELLERS.

WRITING from King's College, Cambridge, Mr. H. W. Holt sends us some further figures with regard to air-propellers or fans driven by a small electric motor. He says:—"As model propellers seem to be greatly discussed at the moment, I am sending the results of a rough test done by myself at the laboratories here on two propellers made by a friend. They were made as patterns for an aluminium casting. The motor used is supposed to be  $\frac{1}{2}$ -h.p., though it has given as much as 1-h.p. The thrust was measured by a lever with a 3-1 advantage, pressing against the motor spindle through a steel ball (there was about  $\frac{1}{4}$  in. side play on spindle). Weights were lifted by the propeller thrust; the propeller remaining practically stationary. A rough calculation of the slip gives No. 1, slip efficiency, 45 per cent; No. 2, slip efficiency, 46 per cent. I ran a light load test of the motor at various speeds, noting power consumed, this I subtracted from power in driving propeller, so endeavouring to get power transmitted approximately."

independently. It will be seen that each main plane is divided into three portions, those at the side being at an upward angle of about eight degrees with the central section. Patent No. 19,805 of 1908. E. H. Hape.

## WRIGHT FLEXING PATENT—SPECIAL NOTE.

The British patent covering the system adopted by the Wright Brothers for flexing the elevator as used on their latest machines, and described in *FLIGHT* of February 6th, 1909, and August 7th last, has just been issued. It is numbered 16,068 of 1909.



## AEROPLANE LAUNCHING TURNTABLE.

An apparatus for launching aeroplanes in any direction is described in this patent. The aeroplane is mounted on a carriage to which is attached a piston working in a cylinder. A charge of suitable gas behind the piston gives the necessary impetus to the carriage for launching the flying machine, and to enable this to be done in any direction the whole apparatus is mounted on a turntable. Patent No. 9,610 of 1909. J. Means.



The results in question are shown in the following tables in connection with which it is only necessary to state that both propellers had an overall diameter of  $17\frac{1}{2}$  ins., with a blade-width of  $2\frac{1}{4}$  ins. at the tip, but that whereas No. 1 had a 21-in. pitch, the pitch of No. 2 was 26 inches:—

	Speed.	Volts.	Amps.	Watts.	Trans-mitted Watts.	h.p.	Thrust. lbs.
No. 1	2,880	192	3.3	633	550	.738	5 $\frac{1}{2}$
	2,788	180	3.1	558	480	.644	5
	2,508	155	2.61	405	342	.459	4
	2,356	143	2.42	346	291	.39	3
	1,964	107	1.88	201	168	.225	2
	1,360	63	1.3	82	67	.090	1
No. 2	2,464	194	3.85	750	690	.92	5 $\frac{1}{2}$
	2,424	186	3.8	707	649	.87	5
	2,264	164	3.4	558	509	.682	4
	2,080	142	2.95	418	379	.507	3 $\frac{1}{2}$
	2,020	135	2.8	378	342	.459	3
	1,672	103	2.15	222	202	.271	2
	1,496	87	1.92	167	150	.201	1

# AERO CLUB OF THE UNITED KINGDOM.

## OFFICIAL NOTICES TO MEMBERS.

### Fixtures for 1909.

September 5-20 Brescia Aviation Meeting.  
 September 25... International Aeronautical Exhibition, Paris.  
 October 3 ... Gordon-Bennett Balloon Race, Zurich.

### Committee Meeting.

A meeting of the Committee was held on Tuesday, the 7th inst., when there were present: Mr. Roger W. Wallace, K.C., in the chair, Mr. Martin Dale, Prof. A. K. Huntington, Mr. V. Ker-Seymer, Mr. F. K. McClean, Mr. C. F. Pollock, Hon. C. S. Rolls, Mr. J. Lyons Sampson, Mr. Stanley Spooner, Harold E. Perrin, Secretary.

**New Members.**—The following new Members were elected:—

T. H. D. Berridge, M.P.	Hardman Arthur Earle.
W. Burdett-Coutts, M.P.	Kenelm Edgcumbe.
Sir John A. Dewar, Bart., M.P.	Henry Farman.
The Hon. Ivor Guest, M.P.	H. Hoyne Fox.
Sir William H. Holland, Bart., M.P.	Ernest Fraser.
Sir Francis Layland-Barratt, Bart., M.P.	William MacGregor Fraser.
W. H. Lever, M.P.	Frank J. Grace.
Alfred Mond, M.P.	Ch. Houry.
Col. J. E. B. Seely, D.S.O., M.P.	Miss L. M. N. Mackintosh.
Lieut. J. F. Ford Anderson, R.N.	Sir James W. Malcolm, Bart.
Lieut. W. D. Beatty, R.E.	Arthur E. Nathan.
A. Leslie Bucknall.	Arthur Peat.
Jacinto Zenon Caminos.	Rev. Charles Prodgers.
Wilfred Chapman.	W. Rendle.
D. K. de Simone.	Maurice Silverston.
	Herbert S. Stoneham.
	Alfred John Barton Tapling.
	Courtauld Thomson.
	A. P. Wright.

### Bleriot's Cross-Channel Propeller.

Mr. V. Ker-Seymer has presented to the Aero Club one blade of the propeller which M. Bleriot used in his cross-Channel flight. The propeller, which was broken in the descent, was picked up by Mr. Ker-Seymer on the Northfall Meadow, and taken with M. Bleriot's consent.

### Gordon-Bennett Balloon Race.

Members wishing to attend at Zurich on the occasion of the Gordon-Bennett Balloon Race on October 3rd, are requested to communicate with the Secretary, the Aero Club.

Providing a sufficient number make the journey, special arrangements will be made with the railway companies.

### Aeroplane Flights at Boulogne.

In connection with the aeroplane flights at Boulogne, the South-Eastern and Chatham Railway Co. announces that week-end tickets are available from Friday to



### Paris Aero Show.

SATURDAY, the 25th inst., has been fixed upon for the formal opening of the Paris Aero Show, when the inaugural ceremony will be performed by President Fallières. The Exhibition will remain open until October 17th. Among the machines on view will be those of Voisin, Farman, Bleriot, Latham, Tissandier, and Breguet. There will also be a large number of aviation motors, including E.N.V., De Dion, Fiat, Esnault-Pelterie, Dutheil-Chalmers, Farcot, Clement, and others, while prominent in the accessory section will be the fabrics of the Continental and Hutchinson makes.



Tuesday, on any service, first-class, 30s.; second-class, 25s.; and third-class, 17s. 10d.

Special excursions run on Sundays and Mondays at 10 a.m. from Charing Cross, fares, first-class, 18s. 6d.; second-class, 14s.; and third-class, 12s. 6d.

### Flying Grounds at Shellbeach.

**Club House.**—The Committee of the Aero Club are proposing to take over Muscle Manor for a Club House on the flying ground. In order that this may be effected, and in view of the very large expenditure which has already been made at Shellbeach, the Committee appeal to the Members for special subscriptions for this purpose. The Golf Course will be taken over for the use of Members, together with the shooting rights extending over 1,000 acres.

The following sums have already been promised:—

Frederic Coleman, £10; Frank McClean, £10; Hon. Maurice Egerton, £10; H. Massac Buist, £2 2s.; J. T. C. Moore-Brabazon, £5 5s.; A. E. George, £4 4s.; C. R. Park, £1 1s.

**Telephone.**—The telephone has now been installed. Members wishing to telephone there are requested to ask for Shellbeach, Minster, Sheppey, no number being required. The telephone is installed in the Club House, and also to the sheds on the grounds.

**Erection of Sheds.**—Members wishing to erect sheds at Shellbeach are requested to apply to the Secretary, who will supply all information.

Members visiting the flying ground are requested to have with them their membership cards, as strict instructions have been given to admit only Members to the flying ground.

**Railway Arrangements.**—The following reduced fares have been arranged with the railway company for members visiting Shellbeach:—

1st Class return, 8s.; 2nd Class return, 6s. 6d.; 3rd Class return, 5s.

Tickets available for one month from date of issue.

Members desiring to avail themselves of these reduced fares are required to produce vouchers at the booking offices. Vouchers can be obtained from the Secretary of the Aero Club. Trains leave Victoria, Holborn, or St. Paul's.

For the convenience of Members, the best train is the 9.45 a.m. from Victoria, arriving at Queenborough 10.55. At Queenborough change to the Sheppey Light Railway for Leysdown (Shellbeach), which is  $\frac{3}{4}$  mile from the flying ground.

HAROLD E. PERRIN, Secretary.  
 166, Piccadilly, W.



### Dual Ignition for Efficiency.

THE Germans in their Zeppelin airships safeguard the vital functions of the electric ignition details by adopting what is known as the dual system, produced in Germany.

The Electric Ignition Company, of Sparkbrook, Birmingham, have recently invented and are now producing an improved form of double ignition for this purpose, so that should one ignition fail, the other can be switched into action instantly. The new system is also intended for motor cars, and practically does away with the turning of the handle to start up the engine.

# AVIATION NOTES OF THE WEEK.

## Mr. Cody Flies for Over an Hour.

ON Wednesday last Mr. S. F. Cody was successful in placing himself among the few aviators who have flown for more than one hour. Going up soon after 6 a.m., he continued flying until his petrol supply was exhausted, when he had traversed about forty miles, the time occupied being 1 hr. 3 mins. At first Mr. Cody flew over Laffan's Plain, but after covering about six miles he left in a northerly direction, and reaching the barracks, he circled over them and the camp before rounding the spire of St. George's Church. Then Mr. Cody again went off, this time in the direction of Fleet, over which he passed, and then over Farnborough. One round of Laffan's Plain was next completed before making, still without a descent, an excursion to Cove Common, and then on to Caesar's Camp, at which time Mr. Cody reached an altitude of about 600 ft. The petrol supply getting rather low, Mr. Cody deemed it prudent to make for home, and he had just got over the Plain again when the engine stopped. The aeroplane glided sharply down from a height of about 150 ft., and the little petrol left in the tank was sufficient to start the engine for a few turns, and so ease the shock of the contact with the ground.

## £1,000 for an Edinburgh-Glasgow Flight.

ANOTHER handsome prize has just been created in Scotland, the value this time being £1,000, and the task set, a cross-country journey from Edinburgh to Glasgow, a distance of a little over 40 miles. The prize has been offered by the *Glasgow Daily Record and Mail* for the encouragement of flight in Scotland, and it is stipulated in the conditions that the successful aviator must be a Scotchman riding a Scotch-built machine.

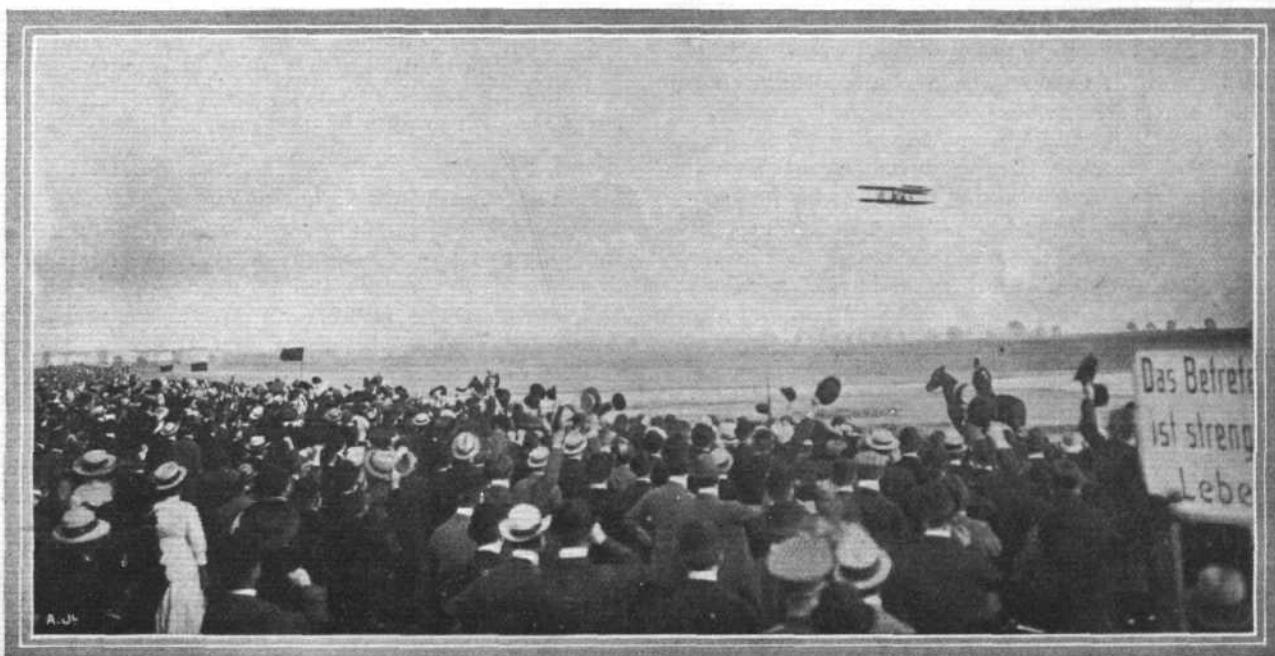
## The Flying Week at Blackpool.

PREPARATIONS for the flying week at Blackpool are proceeding apace. On Saturday morning a visit was made to the various proposed sites by a deputation of the Blackpool Corporation, accompanied by the Secretary

of the Aero Club, when it was decided that the most suitable ground was a portion of the golf links on the South Shore about two miles south of Blackpool, and just by St. Annes-on-Sea. Here a racing track, 250 yards wide and 5 kilometres (about 3½ miles) round will be laid out regardless of expense, all obstructions in the way of mounds, trees, and telephone poles, &c., being removed and ditches filled up, so that the result will be an ideal flying ground. The soil is of a light sandy nature, covered with grass, and possesses very rapid drying qualities, so that the troubles some aviators had in rising from the heavy mud at Rheims will not be experienced here. The prevailing wind is westerly, but the ground is to a large extent protected by sand dunes and the railway bank, which is about 40 ft. high. The wind does not promise to be a great obstacle, for even on the most gusty days the conditions from 4 to 7.30 p.m. could hardly be bettered for flying tests, whilst October is about the calmest month in the year at this favourite seaside resort. The ground is served by Corporation trams, and quite 150,000 of the public would be able to witness the flying at the same time.

With regard to the Prize Fund, a "salary" of £3,000 has been voted by the Council to the Mayor, which will be spent partly on expenses and partly on prizes, while sums of £500 have been offered by Lord Northcliffe, Sir Thos. Lipton, Councillor Parkinson, and Mr. Hulton, the last-mentioned guaranteeing a further £500 if required. Many smaller sums of £100 to £250 have been subscribed, and there is little doubt the total available will be over £13,000.

On Friday, the 3rd inst., a deputation from the Blackpool Corporation, consisting of Messrs. Bickerstaffe and Parkinson, met the Aero Club Committee, and it was decided that October 18th should be the commencing date, and the next day the deputation was entrusted by the Corporation with the work of visiting France in order to make final arrangements with some of the prominent Continental aviators to come over.



FIRST FLIGHT IN BERLIN.—Orville Wright, on his flyer, making his first flight at the Tempelhof Field midst the intense enthusiasm of the crowd.

## Flying Week at Southport.

At a meeting of the Southport Trades Association, a letter from Baron de Forest to the following effect was read:—"I hear Southport is anxious to have an aviation meeting. I can arrange the whole thing for next year, and get all the best exponents. They will come if I ask them, for I know them all." The desirability of holding such a meeting at Southport was agreed upon, and the matter is to be further considered.

## An Aerodrome in the Fen Country.

SPALDING Urban District Council is anxious to have an aerodrome in their district, and have brought before the notice of the Aero Club the claims of the Cowbit Wash, in Lincolnshire, as a suitable ground for flying experiments. It is a ten-mile stretch of flat Fenland country, pasture land in summer, and when flooded and frozen one of the finest skating grounds in winter.

## More Encouragement for British Flyers.

IT is announced in the daily Press that the gold medal of the North British Academy of Arts, Science, Literature, and Music, and the honorary fellowship of the Society, will be conferred upon the first British aviator who flies in a British-made machine from Newcastle to London or *vice versa*. Yet there are wails going up in certain quarters that no encouragement is being accorded to aviation in Great Britain!

## Orville Wright Flies 55 minutes at Berlin.

LAST Saturday, Orville Wright had his flyer out again on the Tempelhof field and flew for 19 minutes. There was not a very large attendance of the public, probably due to the fact that Orville Wright did not take the air on the two previous days, when expectant crowds had been compelled to retire with their disappointment. On Tuesday afternoon a most successful flight, lasting 55 minutes, was witnessed by a very large concourse of people, while on Wednesday two trials were made, one of 35 mins. 56 secs., and a second of 17 mins., with Capt. Hildebrandt as passenger.

## Fatal Accident to M. Lefebvre.

ALL interested in flying were shocked on Tuesday evening by the news that M. Lefebvre had met his death while testing one of the Wright flyers at the Juvisy Aerodrome. A flight of some length had been made on one machine, and M. Lefebvre than changed to another. He had not, however, travelled more than 600 yards or so when the aeroplane suddenly swooped down to earth, and on helpers running to the smashed machine it was found that M. Lefebvre had fallen from his seat, having died almost instantly, apparently from concussion of the brain. It was at first thought that the motor had stopped and caused the accident; but this was not so, as the engine was still running after the smash. The sympathy of all our readers will, we feel sure, be extended to the relatives of the unfortunate aviator in their bereavement. M. Lefebvre, at Rheims, had demonstrated that he had marvellous control of his Wright flyer, and it was felt that he had a brilliant future before him. Our readers will remember that he taught himself to fly in a very short space of time, taking one of the Wright flyers to Holland in order to practice with it, and within a few weeks he competed with great success against those who are past-masters in the art. His loss, therefore, at the early age of thirty-one is much to be deplored. In our leading article this week we refer further to this calamity.

## M. Sommer at Nancy.

By way of adding to the attractions of their Exhibition, the authorities at Nancy made a lucrative offer to M. Sommer to carry out some flights. This he accepted, and has magnanimously decided to devote the surplus of his salary, after paying expenses, to the poor of Nancy and of his birthplace. He arrived at Nancy on the 3rd inst., and found his machine, which had been sent on the previous day, already erected by his two mechanics. During the evening he made just a short flight round the ground, and last Saturday he was out twice, both in the morning and evening. On Monday the weather was against flying, but a large number of people were, nevertheless, admitted to the grounds. Considerable commotion ensued upon the announcement that M. Sommer would not fly. The situation began to look serious, as some of the crowd threatened to break down the sheds and fences, but M. Sommer generously came to the rescue of the authorities. A lull in the wind provided a chance of a flight, of which he took instant advantage, flying once round the ground, and thus the spectators were appeased and retired in orderly fashion.

Four flights were made on Monday, the longest of 35 mins., and in another Mme. Spire was carried as a passenger.

## M. Paulhan at Tournai.

WITH the somewhat high-sounding title of the "Grand Semaine d'Aviation," the flying meeting at Tournai commenced on Sunday last, under somewhat inauspicious circumstances. The entries include machines of MM. Bulot, Breguet, Lasterras, Lelieu, Bonnet and Bregi, and in order to make sure of giving the public something for their money, M. Paulhan was engaged to fly four times a day, weather permitting. On the opening day rain fell during the greater part of the day, and the wind was too strong to suit flyers. Towards evening, however, it moderated, and then M. Paulhan managed to put in three short flights, on the third occasion taking a passenger with him.

## Santos-Dumont at Work Again.

M. SANTOS-DUMONT, after an interval of a month or so, has re-commenced his experiments at St. Cyr with a miniature flyer of the Demoiselle type, and made several short flights on Tuesday. The machine which he is at present using is fitted with a 2-cyl. Darracq engine, which, weighing 45 kilogs. complete, gives 30-h.p., the bore and stroke being 130 mm. by 120 mm.

## Trial Flights.

THE Koechlin monoplane was tried on the 2nd inst. at Juvisy by M. de Nabas, who succeeded in getting the machine to rise to a height of 10 metres. It covered a distance of 400 metres, the flight coming to an end by collision with the railings round the aerodrome offices. The aviator escaped unhurt, but the machine was, of course, damaged.

On September 3rd, "M. de Rue" (Captain Ferber) won the Dejardin prize of 1,000 francs by beating M. Delagrange's time for the circular kilom. at Juvisy, the new time being 1 min. 15 secs. He also flew twice round the course at a height of about 50 metres.

The railings at Port Aviation seem to have a magnetic attraction for aviators. They have already been broken down several times. On Saturday M. Genevyan attempted to fly with the Tanis-Bucheron triplane, but owing to an error in manipulation he, like M. de Nabas, charged the barriers, damaging the machine but escaping unhurt.

## Migratory Bleriot Flyers.

DELAGRANGE is now in Denmark, where he has arranged to give a series of exhibition flights on his Bleriot flyer, while M. Leblanc, his fellow pupil, has been offered a contract to fly at Morrist Park, New York, the terms being 60 flights at 2,000 francs each.

In the meantime, although M. Bleriot's hand still gives him trouble, it is reported that he has made arrangements to fly at Vienna and Budapest for prizes value £3,200.

## Flying at Brussels.

MM. GAUDART AND LEGAGNEUX have been experimenting with a Voisin biplane on the Stockel racecourse at Brussels, their trials being brought abruptly to a conclusion by a false manœuvre on the part of Legagneux, which landed him and his machine among the railings. The cellular tail of the machine was badly smashed. He had previously covered a distance of about 700 metres, while Gaudart made a couple of giant's strides, each about 100 metres in length.

A proposal is being discussed regarding the holding of a flying week on the Stockel racecourse in July next year. It is hoped that the prize fund will amount to about £8,000, towards which MM. Solvaz et Warooquié have promised £2,000.

## Another Grand Prix.

A LETTER has been sent by the Marquis de Dion to the President of the Automobile Club de France suggesting that a sum of 200,000 frs. should be voted from the funds of the Club for the creation of a Grand Prix d'Aviation. If the proposition goes through endeavours will be made to make this the most important flying event of next year.

## Brussels to Ostend for £1,000.

A PRIZE of £1,000 has been offered by our Belgian contemporary, the *Petit Bleu*, to the first aviator who flies from the Etterbeck military parade ground at Brussels to the grounds of the Palace Hotel at Ostend, a distance of 115 kiloms.



## OPENING OF BRESCIA MEETING.

ON Wednesday the Brescia meeting commenced and will continue till the 20th inst. The opening day produced nothing of any great importance, as the only

## Continental "Flying Weeks."

THE success of the Rheims Week has, of course, caused a very large number of other places on the Continent to consider the matter, and proposals for "flying weeks and fortnights" are being put forward thick and fast.

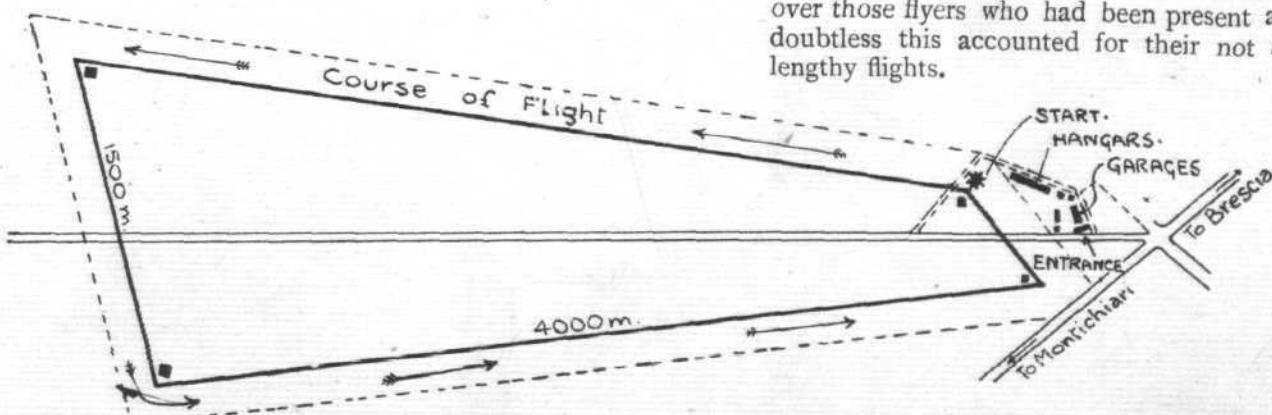
For the special fortnight which is to be held at the Juvisy Aerodrome from October 3rd to 17th, many important prizes are being set apart, while the Frankfort week, from October 3rd to 10th, will see something like £6,000 being distributed in prizes. Boulogne is pushing on with its meeting to be held this month with the cross-Channel trip to Folkestone and back as the chief event, in which Comte de Lambert, Capt. Ferber, Hanriot, and probably M. Paulhan are to take part. Marseilles is engaged in organising a fortnight to be held from the 14th to 28th prox. The chief event will be the Grand Prix, in which the competitors are to fly once round the Parc Borely racecourse, and then go out to sea, circle round the Chateau d'If and Frioul Islands and return to make another circuit of the course. Genoa, too, is organising a meeting, which will include a cross-country flight from Genoa to Milan, and a donation of £400 has been given to the Prize Fund by Marquis Raggio.

## Cash Receipts at Rheims.

FROM figures which have been published, it appears that the receipts from gate money at Rheims during the week amounted to very little short of £35,000, the last day yielding £3,000. The meeting was a great success financially, as the Committee only had to disburse some £8,000 in the way of prizes, so that a large surplus will remain after paying all expenses. Some other figures relative to the meeting are also instructive. For instance, the railway company received £2,000 and carried about 50,000 passengers per day. From the post office on the ground telegrams amounting in the aggregate to nearly 1,000,000 words were sent by Press correspondents, and 50,000 post cards were stamped day by day, the P.O. receipts amounting to £10,000.



present at the meeting and it would appear that the honours will be shared by Curtiss and Bleriot. The news of Lefebvre's tragic death, of course, cast a gloom over those flyers who had been present at Rheims, and doubtless this accounted for their not attempting any lengthy flights.



BRESCIA MEETING.—Diagrammatic plan of the Flying Course at Brescia.

men to really fly were Curtiss and Rougier, both of whom covered about 6 kiloms. Anzani on a Voisin, Calderara on the Wright, and Bleriot and Leblanc on their Bleriot machines, all made attempts to fly, but were not successful. These are the only flyers of note who are

Immense crowds flocked to the flying ground in spite of the poor travelling facilities, both the tram and train services being completely disorganised by the rush.

On the ground, too, the want of organisation was thrown into striking relief after the experience at Rheims. It is not improbable that an attempt will be made some time during the meeting to sail the Italian military dirigible from Bracciano to Brescia, a distance of about 350 miles.

## AIRSHIP NEWS.

## Garage for British Military Dirigibles.

IN connection with the preparations for the proper accommodation of military dirigibles which are being made by the British military authorities, it is reported from Darlington that the Cleveland Bridge and Engineering Co. have secured the contract for the erection at Cove Common, South Farnborough, of a large all-steel building for this purpose. The building is to be completed and ready for use by the end of five months.

## A Mishap to the "Republique."

WHILE on its way to La Palisse, in order to take part in the French manœuvres, the dirigible "Republique" was considerably damaged in an enforced landing caused by a derangement of the water-cooling system. Leaving its shed at Chalais-Meudon shortly after seven o'clock on the 3rd inst., the airship reached St. Hilaire about noon and stopped for an hour. On resuming the southward journey, the east wind increased in intensity and considerably hampered the progress of the vessel. When nearing La Charité, Capt. Bois was informed of a stoppage in the circulation system, and realising the seriousness of his position he determined to descend. After some difficulty, a landing place was decided upon, but the people who came to the assistance of the stranded vessel rather foolishly gave all their attention to holding down the fore part of the car only, instead of evenly distributing their weight. In consequence, the framework of the balloon was considerably bent, and Capt. Bois therefore decided to deflate the gas-bag. This done, with the assistance of the detachment of men who had arrived from headquarters, the airship was taken to pieces and dispatched to the aerostatic establishment at Chalais-Meudon for repairs, which it was hoped would be completed in time to allow the airship to be present at the manœuvres. Incidentally, the powers of the ballooning establishment for quickly dealing with repairs should be thus demonstrated. The "Republique" has only one motor, and this mishap justifies MM. Lebaudy Frères' latest improvement as embodied in the *Morning Post* airship, which will have two motors. This arrangement, however, has not met with favour at the hands of French military authorities up to the present.

## "Zeppelin III" Home Again.

ABOUT an hour before midnight on September 1st the "Zeppelin III," after the completion of repairs at Buebzig, was turned in the direction of Nuremburg, and the journey back to Friedrichshafen resumed. As far as possible the vessel followed the railway line, keeping in sight of a railway train carrying spare parts in case of need. At 3.30 p.m. on the Thursday afternoon, the airship sailed to the east of Nuremburg, and then manœuvred over the city for a little time. Without descending she continued the voyage, passing over Ulm at 8 o'clock, and reached Friedrichshafen at 9.30 on September 2nd, after a non-stop run of  $22\frac{1}{2}$  hours. To-day (Saturday) the airship was to sail to Frankfort, where she will remain a week.

## Reichstag at Friedrichshafen.

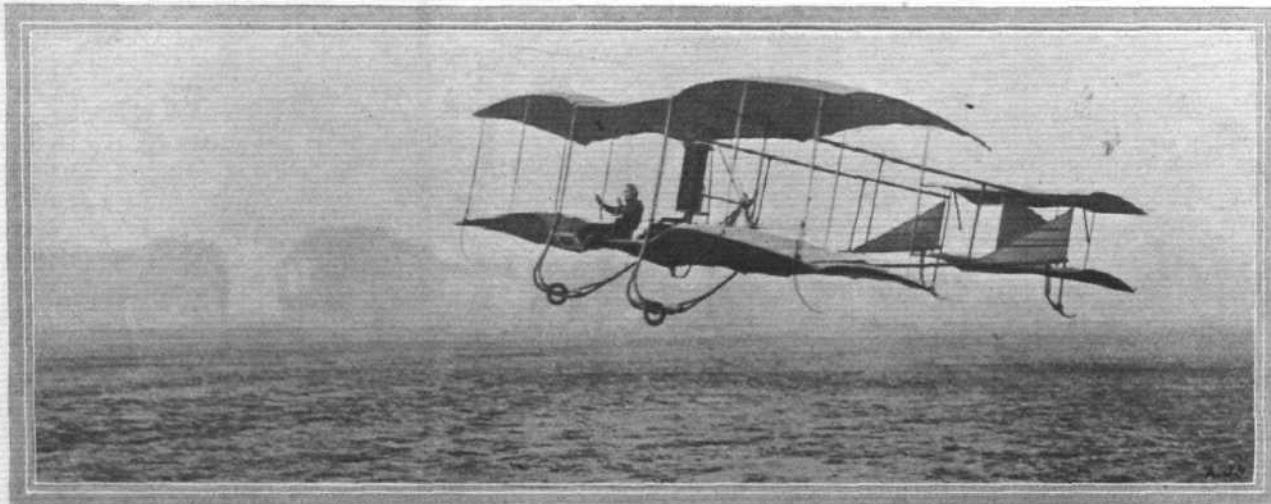
ON Saturday last several hundred members of the Reichstag and the Federal Council availed themselves of Count Zeppelin's invitation to inspect his works at Friedrichshafen, 96 of them, chosen by ballot, making short trips in "Zeppelin III" over Lake Constance. Six ascents altogether were made, 15 members being taken on each trip. The weather kept very fine and Count Zeppelin was accorded an ovation at every place he manœuvred over around Lake Constance.

## Italian Military Dirigibles.

ON the 3rd inst. the Italian military dirigible was given a trial, and, against a strong wind, a speed of 25 miles an hour was reached, while the greatest altitude was 3,280 ft. It is stated that in view of the success attained during these trials, the Italian Government have decided to construct two similar ones for use by the Army, and a third, twice as large, which will be placed at the disposal of the Navy.

## "Clement-Bayard" Airship.

ALTHOUGH the work on the "Clement-Bayard" airship, which is to sail from Paris to London, is being rapidly pushed forward, it is announced that the vessel will not be ready to make her first trial trip in the neighbourhood of Paris before the third week in October.



A SHORT FLIGHT AT ISSY WITH THE LATEST ODIER-VENDOME BIPLANE.—The curved camber of the main planes is the chief feature of this machine which is fitted with a 4-bladed propeller. In the front, on the bottom main plane, at each end is a small steering tip which can be operated for turning and for braking by the pilot. A plentiful supply of spring skids are noticeable for taking any shocks in descent.

## CLUBS AND SOCIETIES.

(NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary.)

## Birmingham Aero Club.

A MOVEMENT is on foot to establish an Aero Club in Birmingham, and at a meeting held at the beginning of the week a letter from Mr. Chamberlain expressing sympathy with the proposal was read. It was stated that several aeroplanes are in course of construction and that half a dozen of them will be ready for trial within six months.

## Kite-Flying Association (27, VICTORY ROAD, WIMBLEDON).

SATURDAY, October 9th, has now been fixed upon as the date for the two competitions arranged by the Kite-Flying Association. The first will be for the best suggested practical use to which a kite can be applied, while the second will be for youths under seventeen, who may submit kites not exceeding 30 sq. ft. In the former competition the prizes will be £5 for the first, and one guinea and a Brookite, value 30s., for the second; while for the second contest the prizes will be £3, £2 and £1, given by the Aerial League. Entries close on October 5th.

## Liverpool Aviation Society (1, EXCHANGE STREET, WEST).

ON Wednesday last the inaugural meeting of the above Society was held, when it was announced that about 75 members had joined, and that this number would be increased shortly. Mr. S. F. Cody was elected Hon. President, Mr. W. H. Lever, M.P., Major Baden-Powell, and Mr. H. S. Higginbotham Vice-Presidents, and Mr. J. R. Wright Hon. Sec. Land and house accommodation have been offered to the Club by Mr. P. McGuffie, of Woolton Hall, Woolton, near Liverpool.



## CORRESPONDENCE.

\*\* The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

## ANOTHER SCOTTISH PRIZE—£1,000.

To the Editor of FLIGHT.

SIR,—I take pleasure in announcing that I have just been successful in arranging a prize of £1,000 for a flight from Edinburgh to Glasgow. This handsome prize has been given by the proprietors, *The Daily Record and Mail*, Glasgow.

Fuller particulars will be furnished later, but meantime might say, that the principal condition will be that it be done by a Scotchman on a Scotch-built machine.

This, with the £500 prize on offer for a successful flight across the Forth near the Forth Bridge, will give our Society a splendid stimulus. Our efforts are meeting with good success.

Yours faithfully,

WALTER G. DUNCAN, Hon. Secretary *pro tem.*,  
The Scottish Aeronautical Society.

## PROPELLERS.

To the Editor of FLIGHT.

SIR,—In the article by John Squires, on p. 393 of your issue for July 3rd, I see that he somehow argues that the driving power of a propeller varies as the cube of the pitch. How is this? Should it not be the square of the pitch? Further, it seems a pity the author did not use a few symbols in his mathematics, as a simple formula connecting driving power with speed, pitch and area would show much better the effects of varying each of these factors than the sixteen unwieldly paragraphs on p. 394.

Yours truly,  
R. C. CLINKER.

[The basis of Mr. Squires argument lies in the last paragraph but one on p. 393. The author is referring to power—not thrust alone.—ED.]

## A MISLEADING ADVERT.

To the Editor of FLIGHT.

SIR,—On reading an advertisement in your last week's issue of FLIGHT, the number of which was Box 6,188, the advertiser states he wishes to invest capital in the aeroplane business. On reaching his office by appointment, I was surprised to find instead of wanting to invest capital he wishes to sell an air-cooled engine which he believes to be an Antoinette. I merely write to your paper in the

## Manchester Aero Club (9, ALBERT SQUARE).

As a result of a meeting held on the 25th ult., it has been decided to form an aero club in Manchester, and a meeting was to be held at the Midland Hotel last Thursday to consider rules and to elect members. Temporarily, Mr. M. Stafford Threlfall has undertaken the duties of hon. sec.

## South-West of England Aeronautical Society (51, ST. LEONARD'S ROAD, EAST SHEEN, S.W.).

A MEETING of the above Society was held last Sunday, when the following elections were confirmed: Committee, J. F. Smith, B. Fransella, Yanto John, A. J. Fransella, F. E. H. Johnson, F. M. Reilly, J. L. Warsop. Mr. Warsop was elected Hon. Treasurer, and Mr. A. J. Fransella undertook the rôle of Hon. Secretary. H. H. Piffard, inventor of the Piffard aeroplane, and A. V. Roe, inventor of the Roe aeroplane, have joined the Society. Mr. A. J. Fransella will be pleased to answer all enquiries at the above address, and urgently requests all those aviators in the South-West of England to do their best to make the Society a success.

## Yorkshire Aero Club (59, WADE LANE, LEEDS).

AT a meeting held at the offices of Mr. Herbert Dunn, Albion Street, Leeds, last Friday evening, it was determined to proceed with the formation of an aero club for Yorkshire very much on the lines of the Yorkshire Automobile Club. Messrs. Dunn, H. A. Jones, Norman Hirst, Albert Farrell, Fawcett F. Sheridan, and R. Macpherson were elected as a committee to draw up a proposal and submit it to a general meeting which was to be held at the end of the week.



interest of readers warning them of what is in my opinion a misleading advertisement. As I stated clearly, I was desirous of investing six or seven hundred pounds in the business.

Trusting you will insert this in your valuable columns,  
Yours faithfully,

H. A.

## PROPELLER ADVERTISEMENTS.

To the Editor of FLIGHT.

SIR,—We notice that the Cochrane Propeller Co. are advertising in FLIGHT that they "have challenged and beaten allcomers." We do not think they have any right to make such a statement in view of the account of the trial against the Beedle propeller which you were good enough to insert in one of your recent numbers.

Yours faithfully,

THE WATFORD ENGINEERING WORKS.

## PROPELLER CHALLENGE ACCEPTED.

To the Editor of FLIGHT.

SIR,—Referring to a letter in your issue of September 4th from Mr. Sidney H. Hollands, we have accepted his challenge, and understand that Mr. Hollands is making arrangements for an aeroplane so that our respective propellers can be tested upon the same machine.

Yours faithfully,

THE WATFORD ENGINEERING WORKS.

## UNDIVIDED REPRESENTATION OF FLIGHT.

To the Editor of FLIGHT.

SIR,—Although I do not at all agree with your remarks re the Aeroplane Club, of which I was the founder, for the simple reason that I started the Club with a view to arousing some interest in this country in "heavier-than-air machines," I think if you will look at it with an unbiased and unprejudiced mind, and apart from the fact that you are the official organ of the Aero Club, you must admit that there was very little done, and very little interest shown at the time I founded this Club. I did so simply to shake people up and interest them in aviation, and I think you will agree that it certainly did this, in more ways than one. After having founded the Club, Mr. Wallace, K.C., the President of the Aero Club, and myself, did everything possible to try and amalgamate the two bodies, seeing that it might be for the good of aviation. I had, and have, no axe to grind whatever in the matter, and was prepared to hand over our interests, together with the Committee of the Aeroplane Club, to the Aero Club; but, after promising to

accept our terms *in toto*, and using the words *in toto*, they refused to do so. Out of fairness to me, I am perfectly prepared to publish all correspondence with reference to this transaction, and if you would appoint a committee of independent people, not connected with the aerial world in any way, and let them go into this case and give their opinion on the matter as to whose fault it was that the two bodies were not connected, I think I may say that our committee would come out on the top.

I simply mention this because, in the interests of aviation, I was willing to work in every way for the Aero Club. I am also prepared to do the same now, and help the Club in every possible way, but if they do not wish to have my support, I do not see that this is any reason for ceasing to work in the interests of aerial machines. If you or anybody else can bring about an amalgamation on lines which will be acceptable to both parties, and primarily for the good of the cause, I am sure that there is not one in the Club who would resent it.

In conclusion, I would say that anything we do as a club towards benefiting aviation, we shall always ask the Aero Club and the other bodies to join us in our work.

We are, as a club, absolutely non-party, and to prove what I say, only within the last week Sir Heneker Heaton and Sir Benjamin Stone, M.P., asked me to get together some of the leading aviators to meet M. Bleriot at the House of Commons at a luncheon party on the 15th inst., and to have an historical photograph taken of the group afterwards. Immediately he asked me I asked the Presidents of the Aero Club, the Aero League, the Aeronautical Society, and other members to come to the luncheon. The same has been done as regards the dinner to M. Bleriot, and also the same was done in our Wembley Park scheme, and in other matters of this sort.

This shows clearly that what I say and what I know, is true, that every one of the members of our General Committee and myself are most anxious to work hand-in-hand with anyone interested in this country, and all we ask is that we shall receive the same support as we offer to them.

Trusting you will find room in your columns for this letter, and complimenting you on the very interesting manner in which you have published your paper, I beg to remain,

Yours faithfully,

W. WINDHAM, Capt.

P.S.—I invited any one of your readers to come and see the monoplane which I am building at these works, and in consequence, from the first thing this morning, there has been a continual stream of people. One of your readers told me that he had been to several works, and found that as a rule there was nothing to see, only drawings on paper, and was agreeably surprised to find that I had at least three machines which I could show him.

[It would be interesting to learn what the Aeroplane Club has actually done in a practical way beyond the model competitions which have been started within the last month. Paragraphs have certainly been very plentiful in the Press pointing out that Captain Windham, King's Messenger, is the founder of the Aeroplane Club, or notifying the intention of the Aeroplane Club to perform functions which, in the natural course of events, would be carried through by the accredited authority for that particular branch of the movement. But beyond this we have as yet been unable to trace any concrete results of the formation of the Club. In regard to the taking over of the Club by the Aero Club, we can hardly doubt but that the Committee of the latter body had sufficient reasons for not completing any suggested arrangements such as those which are referred to by Captain Windham, since it is difficult to imagine any possible cause that could induce the national body to refrain from strengthening its hand at the present time. It would, moreover, seem to be somewhat significant that the subsequent negotiations entered into by the Aeroplane Club with the Aeronautical Society should also have fallen through up to date.—ED.]

To the Editor of FLIGHT.

SIR.—There seems to be an idea, and it often sounds like a selfish or jealous one, that the Aero Club, in conjunction with one or two others, should have almost the entire management of aeronautical displays, competitions, &c., and FLIGHT appears to take this view, for in its last issue, September 4th, it says, "Let not the enthusiastic well-wisher of aeronautic progress in this country fall into the error of helping to set up conflicting representative institutions, which cannot fail to weaken the cause sooner or later."

Now, Sir, I do not want to find fault with the Aero Club and other clubs and their doings, further than to say, there are thousands interested in the subject of flight who cannot keep in touch and take an active part in the lofty doings of such clubs, some on account of expense or other such reasons, and I think it is a mistake to leave such important work, nationally and otherwise, in the hands of two

or three committees that fly so high. Those clubs are doing good work, but only one class has a say in their management. As one who is a member of two or three clubs, and for years a member of the Aeronautical Institute and Club that held its meetings at St. Bride's Institute, a club that did such useful and instructive work under the chairmanship of Dr. Barton, and is now springing into life again under its new name, "The Institute of Flight," re-named on account of the previous name clashing with that of another society.

This institute cost its members very little more than its regular subscription, 10s. 6d., while its monthly meetings were generally well attended, and interesting papers and discussions were enjoyed by its members and visitors, and now that the field of flight has been so greatly widened, we who are interested in this institute hope to renew its useful work, *without weakening*, but ready to help and work in harmony with all societies that have the interest and progress of flight as their aim.

Lordship Lane.

I remain, yours, &c.,

R. SHAPLAND.

[Mr. Shapland has, of course, missed the whole point of the article to which he refers, and has overlooked the word "conflicting" in the sentence he quotes from our last week's leader. Nobody welcomes other bodies that are doing good work, such as Mr. Shapland describes, more than we do—or for that matter more than every reasonable member of the Aero Club must do—but there is a vast difference between what Mr. Shapland would call the less lofty bodies of that character and those fresh institutions whose aims are *competitive* rather than *co-operative* with already existing societies and clubs.—ED.]



## Aeronautical Patents Published.

Applied for in 1908.

Published September 2nd, 1909.

16,941. E. E. LINDKVIST. Driving device for boats and flying machines.

17,150. J. WEISS. Bird-shaped aeroplanes or flying machines.

Published September 9th, 1909.

16,834. PASFIELD. Aerial toy.

17,370. D'EQUEVILLE-MONTJUSTIN. Flying machine.

Applied for in 1909.

Published September 2nd, 1909.

9,235. H. C. LOBNITZ. Aerial machines.

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THE publishers have pleasure in announcing that they have secured a few of the back issues of FLIGHT, and any of our new readers who may wish for complete sets of FLIGHT, January 2nd to last week (including July 31st, with Bleriot machine drawings to scale, and Curtiss biplane Number, July 3rd), can obtain same post free for 8s. od. (abroad 9s. 6d.) from the Publishers, 44, St. Martin's Lane, W.C. Bleriot Number (No. 31), separately, 2s.

Several back numbers are now becoming **very scarce**, and when exhausted no more complete sets will be procurable. Number 16 is 2s. 6d., if obtained separately. The price quoted above includes these scarce numbers.

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